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National Semiconductor

June 1989

# 5437/DM5437/DM7437
# Quad 2-Input NAND Buffers

## General Description

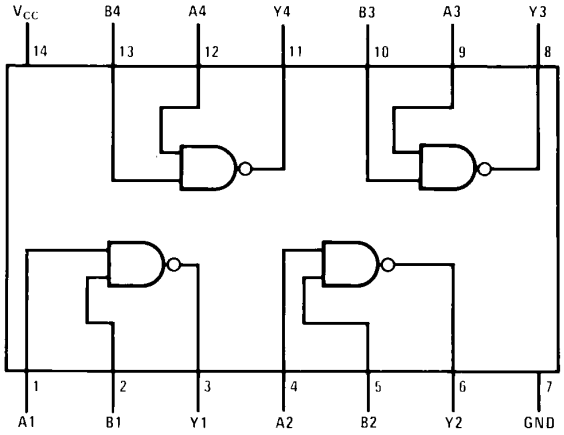
This device contains four independent gates each of which performs the logic NAND function.

## Features

- Alternate Military/Aerospace device (5437) is available. Contact a National Semiconductor Sales Office/Distributor for specifications.

## Connection Diagram

**Dual-In-Line Package**




TL/F/6512–1

**Order Number 5437DMQB, 5437FMQB, DM5437J, DM5437W or DM7437N**
**See NS Package Number J14A, N14A or W14B**

## Function Table

$$Y = \overline{AB}$$

| Inputs | | Output |
|---|---|---|
| A | B | Y |
| L | L | H |
| L | H | H |
| H | L | H |
| H | H | L |

H = High Logic Level

L = Low Logic Level

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## Absolute Maximum Ratings (Note)

**If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.**

| | |
|---|---|
| Supply Voltage | 7V |
| Input Voltage | 5.5V |
| Operating Free Air Temperature Range | |
| DM54 and 54 | −55°C to +125°C |
| DM74 | 0°C to +70°C |
| Storage Temperature Range | −65°C to +150°C |

Note: *The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.*

## Recommended Operating Conditions

| Symbol | Parameter | DM5437 | | | DM7437 | | | Units |
|---|---|---|---|---|---|---|---|---|
| | | Min | Nom | Max | Min | Nom | Max | |
| $V_{CC}$ | Supply Voltage | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| $V_{IH}$ | High Level Input Voltage | 2 | | | 2 | | | V |
| $V_{IL}$ | Low Level Input Voltage | | | 0.8 | | | 0.8 | V |
| $I_{OH}$ | High Level Output Current | | | −1.2 | | | −1.2 | mA |
| $I_{OL}$ | Low Level Output Current | | | 48 | | | 48 | mA |
| $T_A$ | Free Air Operating Temperature | −55 | | 125 | 0 | | 70 | °C |

## Electrical Characteristics

over recommended operating free air temperature range (unless otherwise noted)

| Symbol | Parameter | Conditions | | Min | Typ (Note 1) | Max | Units |
|---|---|---|---|---|---|---|---|
| $V_I$ | Input Clamp Voltage | $V_{CC}$ = Min, $I_I$ = −12 mA | | | | −1.5 | V |
| $V_{OH}$ | High Level Output Voltage | $V_{CC}$ = Min, $I_{OH}$ = Max, $V_{IL}$ = Max | | 2.4 | 3.3 | | V |
| $V_{OL}$ | Low Level Output Voltage | $V_{CC}$ = Min, $I_{OL}$ = Max, $V_{IH}$ = Min | | | 0.2 | 0.4 | V |
| $I_I$ | Input Current @ Max Input Voltage | $V_{CC}$ = Max, $V_I$ = 5.5V | | | | 1 | mA |
| $I_{IH}$ | High Level Input Current | $V_{CC}$ = Max, $V_I$ = 2.4V | | | | 40 | μA |
| $I_{IL}$ | Low Level Input Current | $V_{CC}$ = Max, $V_I$ = 0.4V | | | | −1.6 | mA |
| $I_{OS}$ | Short Circuit Output Current | $V_{CC}$ = Max (Note 2) | DM54 | −20 | | −70 | mA |
| | | | DM74 | −18 | | −70 | |
| $I_{CCH}$ | Supply Current with Outputs High | $V_{CC}$ = Max | | | 9 | 15.5 | mA |
| $I_{CCL}$ | Supply Current with Outputs Low | $V_{CC}$ = Max | | | 34 | 54 | mA |

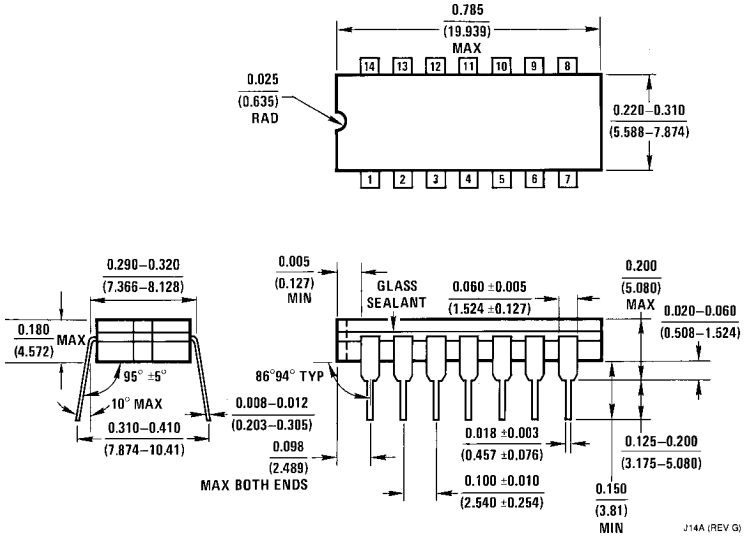
## Switching Characteristics at $V_{CC}$ = 5V and $T_A$ = 25°C (See Section 1 for Test Waveforms and Output Load)

| Symbol | Parameter | Conditions | Min | Max | Units |
|---|---|---|---|---|---|
| $t_{PLH}$ | Propagation Delay Time Low to High Level Output | $C_L$ = 45 pF, $R_L$ = 133Ω | | 22 | ns |
| $t_{PHL}$ | Propagation Delay Time High to Low Level Output | | | 15 | ns |

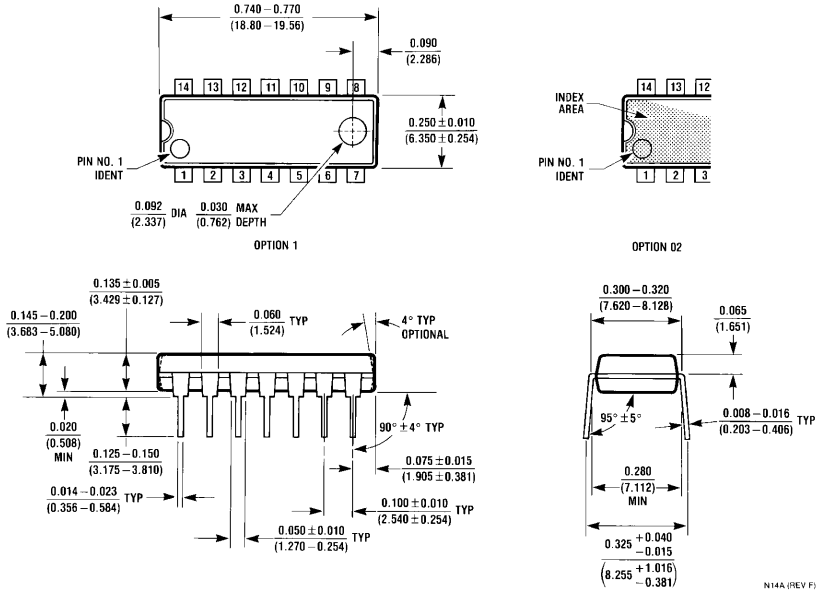
**Note 1:** All typicals are at $V_{CC}$ = 5V, $T_A$ = 25°C.

**Note 2:** Not more than one output should be shorted at a time.

## Physical Dimensions inches (millimeters)

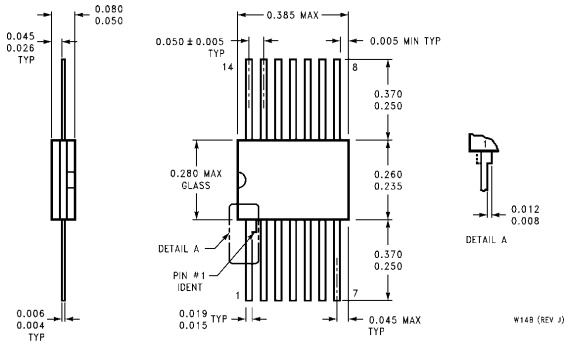



**14-Lead Ceramic Dual-In-Line Package (J)**
**Order Number 5437DMQB or DM5437J**
**NS Package Number J14A**




**14-Lead Molded Dual-In-Line Package (N)**
**Order Number DM7437N**
**NS Package Number N14A**

## Physical Dimensions inches (millimeters) (Continued)




**14-Lead Ceramic Flat Package (W)**
**Order Number 5437FMQB or DM5437W**
**NS Package Number W14B**

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